Information: A Historical Companion

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Abstract: Thanks to modern technological advances, we now enjoy seemingly unlimited access to information. Yet how did information become so central to our everyday lives, and how did its processing and storage make our data-driven era possible? This volume is the first to consider these questions in comprehensive detail, tracing the global emergence of information practices, technologies, and more, from the premodern era to the present. With entries spanning archivists to algorithms and scribes to surveilling, this is the ultimate reference on how information has shaped and been shaped by societies. Written by an international team of experts, the book's inspired and original long- and short-form contributions reconstruct the rise of human approaches to creating, managing, and sharing facts and knowledge. Thirteen full-length chapters discuss the role of information in pivotal epochs and regions, with chief emphasis on Europe and North America, but also substantive treatment of other parts of the world as well as current global interconnections. More than 100 alphabetical entries follow, focusing on specific tools, methods, and concepts—from ancient coins to the office memo, and censorship to plagiarism. The result is a wide-ranging, deeply immersive collection that will appeal to anyone drawn to the story behind our modern mania for an informed existence. Tells the story of information's rise from 1450 through to today Covers a range of eras and regions, including the medieval Islamic world, late imperial East Asia, early modern and modern Europe, and modern North America Includes 100 concise articles on wide-ranging topics: Concepts: data, intellectual property, privacy Formats and genres: books, databases, maps, newspapers, scrolls and rolls, social media People: archivists, diplomats and spies, readers, secretaries, teachers Practices: censorship, forecasting, learning, political reporting, translating Processes: digitization, quantification, storage and search Systems: bureaucracy, platforms, telecommunications Technologies: cameras, computers, lithography Provides an informative glossary, suggested further reading (a short bibliography accompanies each entry), and a detailed index Written by an international team of notable contributors, including Jeremy Adelman, Lorraine Daston, John-Paul Ghobrial, Earle Havens, Niv Horesh, Sarah Igo, Lauren Kassell, Pamela Long, David McKitterick, Elias Muhanna, Carla Nappi, Geoffrey Nunberg, Neil Safier, Haun Saussy, Erin McGuirl, Jacob Soll, Siva Vaidhyanathan, Alexandra Walsham, and many more.

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INTRODUCTION

Information: A Historical Companion explores how information has shaped and been shaped by human society across ages past and present. It offers readers views of history through the lens of information and views of information through the lens of history.

Such a project might seem paradoxical. In 1964, the media scholar Marshall McLuhan declared his the "age of information." The idea was widely taken up, so that in the following decade an IBM advertisement could announce, "Information: there's growing agreement that it's the name of the age we live in." Both announcements thrust information to the fore but in the process suggested that it and related information technologies of the sort IBM made had created a fundamental break from the past. History, by these and similar accounts, can seem retrograde, irrelevant to forward-looking information. This book is built on the belief that, contrary to IBM's assertion, "growing agreement" might reasonably be claimed to point another way. Since the 1970s, books, conferences, and university courses have shown increasing interest in information in prior ages. In the process, a growing body of information-focused research has thrown new light on both the past and the present, drawing the two together rather than separating them. Indeed, as this book goes to press, two other significant collections, *Information Keywords* and *Literary Information in China: A History*, are also coming into print. Together those volumes and this one reveal the remarkable range of approaches to and topics in information history that are raising interest and enthusiasm within academia and beyond.

For its part, this book assembles researchers who have engaged directly with information in historical context to illustrate for scholars and general readers alike the breadth and the depth of these developing perspectives. The contributors look at the emergence across history of new information practices, technologies, and institutions as these developed to address informational challenges of their day. In particular, they look at moments of confrontation and transition—beginning, for example, with Columbus's legendary encounter with Caribbean societies in 1492—to reveal how approaching these as part of a history of information provides fresh insight into how they unfolded at the time and how they might be better understood today. From this starting point, the thirteen long articles in part 1 of the book present a cumulative narrative bringing this exploration of information in history to the present. The 101 short entries in part 2 examine in depth particular topics that are critical to such an exploration. Together, contributors to *Information: A Historical Companion* show how information and information technology were crucial to earlier ages, as they are to our age today.

Information, of course, is an expansive term. Consequently, any starting point for an investigation can seem arbitrary, and convincing arguments can always be made for starting elsewhere. But given inevitable constraints of space and time in a publishing venture such as this, the editors have chosen to focus principally on the *early modern and modern periods, from circa 1450 to the present. Nonetheless the early articles and

many of the entries look back well before this to allow the overall collection to develop a continuous, information-focused narrative across many historical contexts down to the present in the scope of a single volume and with sufficient depth to reveal emergent and enduring themes. Within this constraint of continuity, the editors sought entries that engaged diverse issues and places and took distinct approaches to the topic of information. The attempt to achieve both continuity and diversity makes no claim to comprehensiveness. While it is hoped that this selection will appear judicious, all contributors, as well as the editors, are aware of inevitable gaps. They hope that the collection as a whole can indicate how topics omitted might nonetheless be illuminated by the overall information perspectives of the collection. Together, the articles reveal recurring responses to social change, thereby making evident over time and across cultures the resilience of attitudes familiar today, such as information optimism and information anxiety or faith in information "solutions" and surprise at their unintended consequences.

The opening account of Columbus and the Silk Road introduces globalization as one of the volume's major themes, represented by emerging networks of travel and communication across Asia, the Islamic world, and Europe. Informational connections inevitably shaped this "road" as not only silk and spices but also word of supply and demand and technologies such as paper and forms of writing and mathematics passed back and forth, opening new worlds, both literally and metaphorically, to recipients. These exchanges also fostered spiritual and scientific engagements, as intrepid Buddhists, Muslims, and Christians traveled in opposite directions along these interconnecting pathways, appearing in new environments and before new audiences, then sending back reports of such encounters. Supporting this circulation, the Silk Road and similar communication channels emerge as complex sets of social, institutional, and geographical networks, continuously circumscribed by short- and long-distance demands of and for information. In response to these demands, practices from printing to record keeping developed to formalize and reify information in different ways, and new communication channels able to carry such reifications arose, including crucially important forms of postal networks.

These developing interconnections played a significant role in shaping what we now think of as information technologies. Printing, which appeared first in the Sinosphere and centuries later in Europe, was crucially transformed and transforming in interactions with state, market, and culture. Analyses of these different settings and the information practices they favored add complexity to the simple determinism that accounts of information technology otherwise often assume. New information techniques also accompanied the formation of commercial relations, including the emergence of accounting devices for making and recording market exchanges, such as the financial "ledger" (a historical, transnational technology whose enduring contribution is evident today in the ledgers of Bitcoin and other digital currencies). On the one hand the articles track an increasing use of information to control and stabilize markets, as well as attempts by markets to control information in order to commodify and commercialize it. On the other hand the articles also explore the drive to resist control by removing restrictions and liberating the circulation of information. This resistance to control is particularly noticeable in the accounts of scientific groups and educational institutions that sought autonomy for members and also for their information so both could circu-

late across national, political, and religious boundaries. In particular the development and spread of new forms of scholarly information included natural histories, encyclopedias, and other kinds of reference works (all in different ways, of course, forerunners of this book).

One of the most influential developments explored across this volume is the rise of the "information state" and its informational apparatus—chanceries, secretaries, surveillance, archives, and the like—designed to help assert political control over populations. Among the most pervasive state-driven contributions revealed in these accounts are the standardization of information, through such things as forms and questionnaires, and the quantification such standardization allowed as populations were counted in different ways for different reasons. The passport, as one article shows, offers an unexpected and insightful view of the state's attempts to standardize both information and population and of their normative impact. Conversely, as the state sought to control people through information, others sought to use information to help control the state, and inevitably states pushed back. Thus articles in part 1 move from the rise of "public information" in Japan to the periodical and the press in the West and the emergence of the information media of the "public sphere" along with state initiatives to control the press and public opinion directly or indirectly.

The cluster of articles focused on the nineteenth century and early twentieth century track the development of electromagnetic and then electric technologies, including the telegraph, telephone, phonograph, radio, and television, showing how these technologies transformed prior assumptions about the relation between information, nation-states, and the public. Nonetheless, despite these apparently transformative technologies, themes of unequal distribution, problematic standardization, commodification, normativity, and state control return, along with new bouts of anxiety about increasing quantities of information and contrasting optimism about its potential to create efficient and effective markets and democracies. The final articles in part 1 take the collection from telephone and telegraph into IBM's "information age" with discussions of new communication and search technologies, exploring ways in which, despite claims of "revolution," recent developments and enthusiasms often parallel those discussed in earlier chapters. Throughout, these discussions repeatedly raise important questions of information politics and ethics that run from Magellan's (and Columbus's) willingness to lie to their crews to the development of propaganda to support state interests and the appropriation of personal information to improve search and surveillance technologies.

While part 1 builds a chronological narrative from the early modern period to the present, each of the entries in part 2 focuses on a particular topic critical to understanding information in history, from accounting, algorithms, and archivists to secretaries, social media, surveilling, and much more. The 101 short entries, which appear alphabetically, are also grouped together under a series of thematic categories (the category "objects," for instance, includes essays on coins, government documents, and inscriptions) and are linked to one another by cross-references. The book also contains a glossary, collecting and elaborating terms that may be unfamiliar to readers or that are used in distinctive ways in this volume. The cross-references and the glossary seek to support both the autonomy and the focus of particular pieces as well as the cumulative interdependence of the collection as a whole.

Information's complex character presents challenges to anyone trying to undertake this sort of historical enquiry. As noted, influenced by arguments like those of McLuhan and IBM about the "information age," many assume that information is a critical feature for the present age alone. Conversely, other scholars have followed the linguist and computer scientist Anthony Oettinger, who in 1980 argued that "every society is an information society." *Information: A Historical Companion*, while recognizing changes over time, clearly takes the latter view. But in so doing, it faces questions about whose notion of information is at stake. Is it the historian's notion or that of the subjects of historical study? The latter perspective is exemplified in the words of the historian Peter Burke, whose *Social History of Knowledge* (2000–2012) seeks to trace "what early modern people—rather than the present author or his readers—considered to be knowledge." This is an important distinction; hence this book highlights people becoming aware of information as a critical aspect of their lives. But the alternative view, allowing examination of historical actors who did not have the term or the concept but whose behavior can nonetheless be illuminated with insight from current perspectives of information, is equally important here. Contributors have taken what they have seen as the appropriate approach for each topic.

Using the term *information* itself presents further challenges. Not only does the word favor particular (i.e., Latinate) languages, but even within those languages, *information* has been used in quite different ways in different times and contexts. Given these complexities, it might seem plausible to define *information* as a technical term to be shared among this book's contributors, thus putting to one side both historical and contemporary variations. Unfortunately, such definitions are as likely to generate as to resolve difficulties. For instance, it seems unexceptional to take "information" as a carrier of meaningful ideas between people. Such views, however, must confront the pioneering information theorist Claude Shannon, whose work, discussed in several of the pieces that follow, probably did more than any other to promote ideas of an "information age." Shannon's theory held meaning as irrelevant to information. Many also assume that information is an objective entity. Yet Geoffrey Bateson's famous definition of information as "a difference that makes a difference" (which is, deservedly, one of the most cited definitions in this book) portrays information as personally subjective: the ability to make a difference depends not only on the communication, but also on what the recipient knew before. Similarly, some take information as an autonomous entity that can be removed from one context and unproblematically presented in another. McLuhan, however, famously argued that in the age of information "the medium is the message," suggesting that context is inescapable.

Overall, the problems of definition are perhaps best exposed in a study in 2007 by the information scientist Chaim Zins that compiled definitions of *information* (and *data* and *knowledge*) offered by forty-five information scholars from sixteen countries. The compilation revealed 130 distinct notions, with different degrees of compatibility with one another, but no one capable of encompassing all the different variations. Contributors to this collection proceeded using their own understandings rather than subordinating themselves to a single definition. Their contributions reveal both common and distinctive threads across the volume's different historical and thematic explorations. Nonetheless, one aim of the book is, where possible, to encourage contributors and readers to weave these threads together.

While following the development of current scholarship, another goal of this book is to engage readers outside the academy. Consequently, the book eschews scholarly footnotes and long bibliographies, offering instead short "further reading" lists. (For those seeking more depth, the editors are maintaining a fuller bibliography of works explicitly and implicitly invoked in articles. This can be reached through the Princeton University Press website for this book at https://press.princeton.edu/books/hardcover/9780691179544/information.) Overall, both long and short pieces work individually and together to illustrate key facets of information's **longue durée* and wide reach from multiple perspectives. Again, this collection makes no claim to be comprehensive but rather aspires to be illustrative. Its editors hope that it will provide a range of audiences with useful and reliable insights, but also that it will prompt readers in the developing field of information history to pursue new questions and fill gaps made evident by this attempt.

Paul Duguid

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The editors would like to extend deepest thanks to the contributors to *Information: A Historical Companion*. Their enthusiasm in the process of putting the volume together, their responsiveness to comments, the help that they lent to one another, and the quality of their final submissions all lie quite beyond initial expectations and will be, we are confident, appreciated as much by the readers as by the editors. In particular, we would like to acknowledge the work of the authors of the articles in part 1 for both their remarkable contributions and their significant collaborations with the editors and with one another. The editors extend similar thanks for their oversight to the project's advisory board, Jean Bauer, Arndt Brendecke, Peter Burke, Michael Cook, Richard Drayton, Markus Friedrich, Randolph Head, Matthew Kirschenbaum, Carla Nappi, Daniel Rosenberg, and Jacob Soll, several of whom also contributed to the book. The editors are also deeply grateful to Princeton University Press and Anne Savarese and her staff, in particular Thalia Leaf, Jenny Tan, and Natalie Baan, for the extraordinary support and responsiveness provided throughout the process of assembling the book, and also to Kathleen Kageff for scrupulous copyediting and Tobiah Waldron for indexing the volume. Warm thanks also go to Jeremy Norman for the support of his History of Information website (HistoryofInformation.com) and to Theodore Delwiche for his work on the preparation of the glossary and related materials. All these people helped make a long process much easier for the editors, resulting in what, it is hoped, will be for all an informative and rewarding endeavor.

HOW TO USE THIS BOOK

Part 1 contains thirteen long articles that together provide a chronological narrative of the history of information from the early modern period to the present. Part 2 contains 101 short entries, focused on particular issues central to that history.

The short entries are arranged alphabetically. Each concludes with cross-references (labelled "see also") pointing to other entries in the volume that explore related topics.

For readers interested in further research, each entry concludes with a "further reading" list of books and articles important to the topic under discussion. In a few cases, such as quotations drawn from secondary sources, brief parenthetical references within the entry point to their source.

Words marked with an asterisk (*) on first mention within an entry can be found in the glossary, which defines terms used in specific ways within this book. Foreign words appear in italics on their first mention within each entry. Foreign terms and titles of books, newspapers, and the like have generally been translated if they are not explained. Translations often appear in parentheses after the original name—for example, *Tiangong Kaiwu* (The exploitation of the works of nature) or *Frankfurter Postzeitung* (Frankfurt postal newspaper).

A general index aids navigation across the multiple topics and issues that make up the volume as a whole.

Finally, an expanded bibliography offered by our contributors on their several topics can be found through the book's website, which will be linked from the Princeton University Press website and updated periodically.

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Pages in bold denote an entry devoted to the term. An asterisk signals that the term appears in the glossary.